A NEW INDIRECT IRRIGATING OBSERVATION AND DOUBLE CATHETERIZING CYSTOSCOPE.

BY LEO BUERGER, M.D.,

OF NEW YORK,

Assistant Adjunct Surgeon and Associate in Surgical Pathology, Mt. Sinai Hospital; Associate Surgeon, Mt. Moriah Hospital; Cystoscopist, West Side German Dispensary.

In spite of the fact that a large number of modifications of the Nitze cystoscope have been offered to the genito-urinary surgeon during the past ten years, we still do not possess an ideal indirect vision instrument which will permit of irrigation while the process of double catheterization is going on. About nine months ago Dr. F. Tilden Brown designed an indirect vision telescope and catheter bed which could be attached to his "composite cystoscope" and which promised to fill this want. Working along similar lines, but adhering more strictly to the original type of the Nitze instrument, I have been able to develop an instrument in which the Brown sheath, with certain necessary changes, has been combined with the Otis telescope and the Albarran deflecting device, in such a manner as to overcome most of the objectionable features possessed by the older instruments.

The instrument consists of three parts, the sheath, the obturator and the catheterizing telescope. The sheath is circular on cross section, bears a very short lamp at its end, measures eight and one-quarter inches in length and possesses a large fenestra or window behind the lamp. Its calibre is 24 of the French scale (Figs. 2 and 3). Save for the lamp, which points toward the concavity of the instrument and the window, the sheath has much in common with that employed in Brown's direct vision cystoscope.

The obturator, which closes the working aperture, is perforated so as to allow irrigation even when it is in situ, through the two lateral faucets in the sheath.

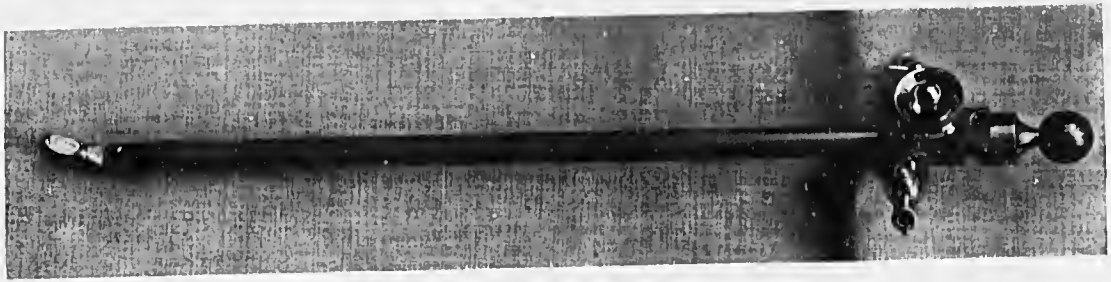
Fig. 1b.

Fig. 1a.

Fig. 1.

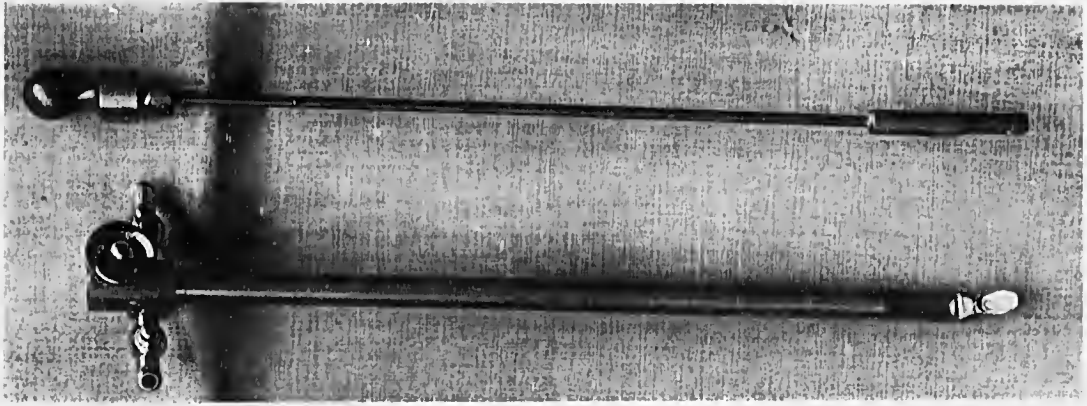
Sheath. Obturator. Catheterizing telescope.

Fig. 2.



Cystoscope sheath with obturator in place.

FIG. 3.



Cystoscope sheath and obturator.

Fig. 4.

Catheterizing telescope with catheters in place lies in the sheath; the deflector (or finger) is raised and catheters are deflected by it.

The catheterizing telescope combines in one piece the optical apparatus, the mechanism for deflection (Albarran) and the catheter grooves or beds. A glance at Fig. 1*b* will show that the telescope carries a double grooved bed upon its upper aspect. This is large enough to permit the lodgement of two number 7 French ureteral catheters. At the end near the lens this gives way to a closed ring in which the tips of both catheters are held secure. A large deflector or catheter-lift is implanted between the lens and the ring and hinges on a small wedge, which latter serves the double purpose of fulcrum and inclined plane for giving the catheters their primary deviation. All the parts are exposed so as to permit easy cleansing and easy repair.

FIG. 4*a*.

Catheterizing telescope in place.

The technic of its employment is as follows: The sheath with obturator in situ is introduced into the bladder; the obturator is then removed and the bladder irrigated through the open end of the sheath. After evacuation of the irrigating fluid the telescope with the two catheters in place is introduced. The bladder is now distended with the requisite amount of fluid through one of the two irrigating faucets. The catheterization of the ureters is effected in the same way as in the Nitzen–Albarran instrument.

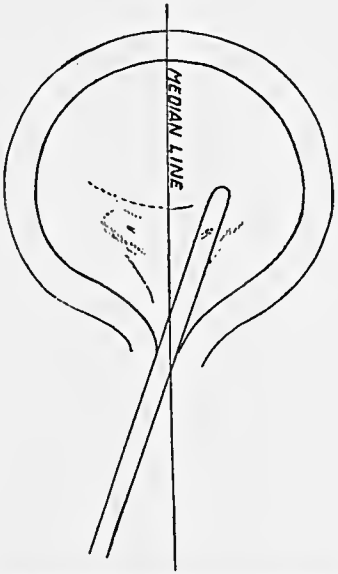
It may not be amiss to give the details of a procedure for catheterizing the ureters which varies somewhat from that which is usually laid down in the text-books, but which has given me the most satisfaction.

1. The ureteral opening is found and the ocular end of the cystoscope is brought slightly to the opposite side of the patient. By raising the shaft the ureteral slit is made to occupy a point just below the centre of the field. *This position must be rigidly maintained during the next two steps.* It is

best to get a picture of the ureter which is about the normal size; this is obtained when the objective is at a distance of 1 to 1⅛ inches (Figs. 5, 6 and 7).

2. After the deflector has been slightly raised (just sufficient to prevent the catheter from hugging the lens) the

FIG. 5.



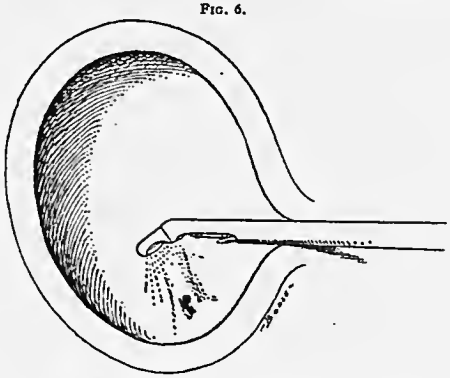
Position of cystoscope in normal ureteral catheterization.

catheter is pushed forward about 1 to 1.5 centimetres beyond the limit of the field. Now the catheter appears enlarged, for it lies close to the prism (Figs. 8, 9 and 10).

3. The deviation is gradually increased by raising the deflector, the movement of the catheter in the field being observed during this procedure. The tip of the catheter now comes into view, first appearing at the bottom of the field and gradually travelling upward, its size diminishing at the same

time. *When its tip is a short distonce above*[1] *the ureter, it is usually in the proper position;* in reality it then lies in front (nearer the neck of the bladder), above, and slightly to the inner side of the ureteral mouth (Figs. 11 and 12).

FIG. 6.



Normal ureteral catheterization: first move; cystoscope in normal position.

FIG. 7.

Cystoscopic view: we see the ureter somewhat below the centre of the field; view seen in Fig. 6.

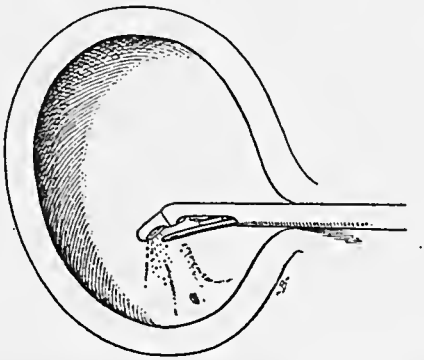
4. By now raising the shaft of the instrument, and at the same time passing it further into the bladder, the tip of the catheter is made to enter the mouth of the ureter.[2] There-

[1] Apparently "above"—that is, "above" in the field; or, if we wish to regard it so, "behind" in the field.

[2] We must remember that when we raise the ocular, the ureter seems to travel down the field; when we push the instrument further into the bladder, the ureter goes up the field. Hence the degree motion of the cystoscope into the bladder must exceed the lifting of the shaft in order to make the ureter meet the tip of the catheter.

fore the cystoscope and catheter as a whole travel towards the opening and not the catheter alone (Figs. 13 and 14). In the picture we see the ureter ascend to meet the catheter

FIG. 8.



Normal ureteral catheterization: second move; the tip of the catheter lies beyond the field.

FIG. 10.

FIG. 9.

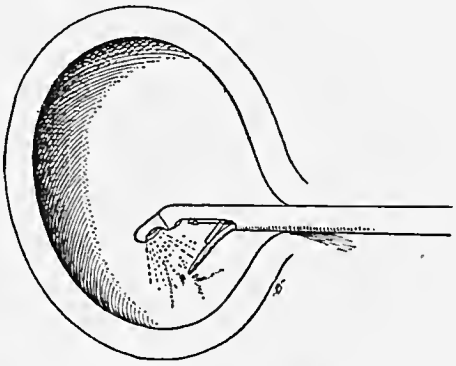
FIG. 9.—Cystoscopic view: the catheter is being pushed across the field.
FIG. 10.—Cystoscopic view: the catheter lies beyond the field; view seen in Fig. 8.

at about the middle of the field. When the catheter has engaged the ureteral opening it is pushed a short distance forward, the deflector is depressed somewhat, and, by still further raising the ocular, the introduction of the catheter becomes easy.

The lid (deflector) is now turned down, the other ureter sought, and the same method employed.

After a little practice we learn just how far to push the catheter before giving it the complete deviation.[3] The amount

FIG. 11.



Normal ureteral catheterization: third move; the catheter has received its full inclination.

FIG. 12.

Cystoscopic view: the catheter tip lies just above the ureteral opening; view seen in Fig. 11.

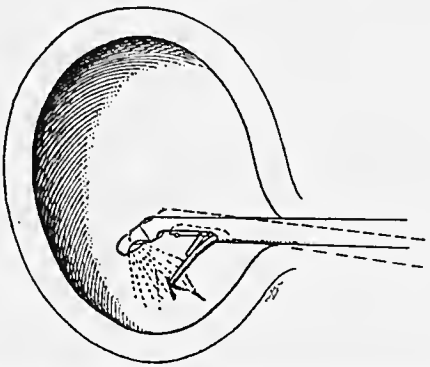
of unsheathed or exposed catheter must be such that the catheter tip projects about 1 to 2 centimetres beyond the level

[3] The primary deviation must be very slight, just enough to prevent the catheter hugging the lens. Of course if the catheter be deflected too much at the start, then a much greater portion can be pushed out before it reaches the periphery of the field. In using the Nitze instrument I usually make the catheter pass 1 to 1.5 centimetres beyond the field (no primary deviation having been given), then deflect it as described.

of the tip of the lamp. This leaves sufficient room for the instrument to travel, and the chances of contact between lamp and bladder wall are very slight.

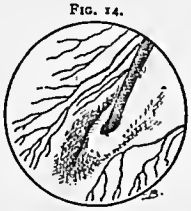
Although this may be considered as a normal method, certain variations in technic will be required in difficult or

FIG. 13.



Normal ureteral catheterization; fourth move; by the forward motion of the instrument and the ascent of the ocular, the tip of the catheter is made to enter the ureter.

FIG. 14.

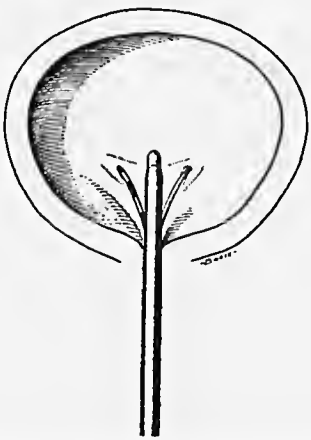


Cystoscopic view; catheter has entered; view in position Fig. 13.

anomalous cases. Thus, we may find it advantageous to change the amount of deflection; or to retain the maximum deviation while pushing the catheter along the ureteral canal. If we see that the bladder wall is being raised considerably by the entering catheter, we know that the anterior wall of the ureter is being lifted up by the catheter. This occurs es-

pecially when stiff catheters are used and when the deflector has been turned down too far. For in both instances the catheter has a tendency to seek a higher level, one approaching the plane of the shaft of the instrument. To overcome this, three manœuvres are permissible, either raising the ocular so as to bring the ureters more nearly in the direction of the ureteral canal, or increasing the deflection, or a combination of both.

FIG. 15.



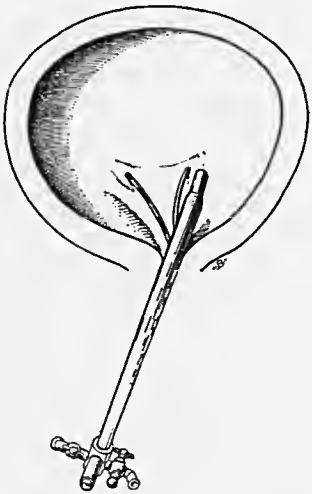
Removal of sheath: first position; the telescope has been removed; the catheters lie loose in the sheath.

If carefully carried out this procedure is far superior to that by which the catheter is "aimed" at the opening and pushed out to meet it. It affords a more certain way of hitting the mark, avoiding scraping of the bottom of the bladder, and, with the long deflector provided in the new instrument, is extremely easy of execution.

The catheter-bearing telescope and sheath have been so proportioned that even when two number 7 French ureteral catheters are being used, sufficient space is left to allow irrigation of the bladder during the process of catheterization.

The following manipulations will enable us to remove the instrument with ease, leaving the catheters in the ureters. After having introduced the catheters a little higher than we would if the instrument were to remain in the bladder, and after removal of the telescope, the following movements should be carried out: first, the ocular is depressed and carried a lit-

FIG. 16.



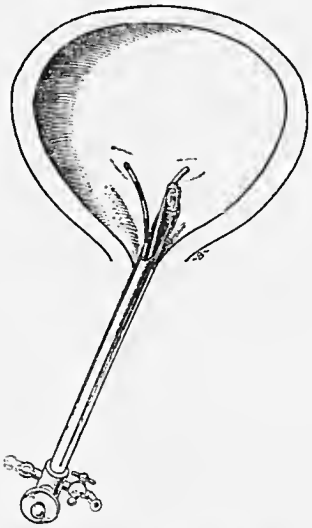
Removal of sheath; second position; with depressed ocular; the beak and catheters are disengaged.

tle to the left, thus separating the beak from the line of the catheters (Figs. 15 and 16); second, the whole instrument is rotated to the right on its longitudinal axis through an arc of 180 degrees, retaining the relative position just described, thus making the beak point upward (Fig. 17); third (still in the same plane, with the ocular a little to the left), the ocular is raised and brought back to the median line in order to bring the convexity of the beak against the trigone of the bladder (Fig. 18); and fourth, the sheath is removed, its

inferior aspect being made to hug the posterior wall of the urethra.

Should we desire to use the cystoscope for observation only, a telescope giving an extraordinarily large field can be inserted instead of the catheterizing apparatus. A retrograde-vision telescope or a small telescope with operating instruments may be also substituted.

FIG. 17.



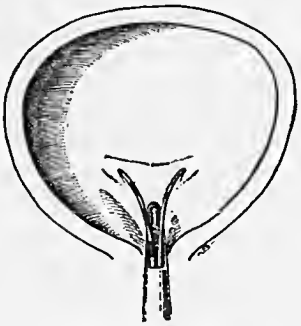
Removal of sheath: third position; the beak is turned up.

Some of the special features may deserve mention before we sum up the advantages of this instrument. First, the small size of the lamp diminishes the likelihood of contact between lamp and bladder wall.[4] Second, the distance between the distal end of the filament (which point corresponds

[4] If we desire to use the instrument for observation alone a larger lamp may be screwed on; this is not essential.

to the brightest part of field) and the centre of the objective lens has been reduced as much as possible in order to attain the maximum illumination for any given sized lamp. Dr. F. T. Brown had already suggested this improvement for the Otis observation cystoscope. Third, the large size of the deflector gives firm support to the catheters. Fourth, the relative positions of the lens, deflector and margin of the window are such that catheterization is easy, the catheters always remaining in the field when properly deflected; and fifth, no difficulty

FIG. 18.



Removal of sheath: the sheath is being removed.

is encountered in deflecting the second catheter even when number 7 French catheters are employed.

The advantages of the combined indirect irrigating observation, double catheterizing and operating cystoscope over others of its type may be summed up as follows:

1. The employment of a catheter for washing out the bladder is not necessary, the sheath serving this purpose.

2. Because of its small calibre (24 French),[5] its round shape, and its smoothness in the region of beak and window, the introduction of the instrument is easy and injury to the deep urethra is avoided.

[5] If we are satisfied with the use of two No. 5 or 6 French ureteral catheters, the instrument can be constructed so that its calibre is 22 French.

3. It carries larger catheters than any other indirect vision cystoscope, although its diameter is smaller. Two number 7 French catheters pass with ease.

4. The telescope and sheath may be removed, leaving the catheters in the ureters.

5. Irrigation of the bladder may be very rapidly effected by removing the whole catheter-bearing telescope or by washing through the faucets in the sheath. This may be continued whilst the process of catheterization is going on.

6. By the employment of the grooved beds the catheters are separated in such a manner that friction between them is impossible; a new catheter can be inserted at any time without removing the telescope. This was borrowed from the improved Brown instrument.

7. The proximity of lamp and objective lens gives the best illumination for catheterizing purposes.

8. The small size of the lamp makes the chances of contact with the bladder wall small.

9. Inasmuch as the catheter-bearing mechanism is separable from the sheath and is not introduced until the bladder is clean, *the likelihood of carrying infection into the ureters is reduced to a minimum.*

10. A large telescope for indirect or retrograde vision may be used in the same sheath.

11. A small telescope will leave ample room for the introducing of operating instruments of various kinds.

12. The addition of a correcting prism to the ocular produces an upright picture and enhances the brilliancy of illumination[6] (orthocystoscopy).

It gives me great pleasure to acknowledge my indebtedness to Dr. Abraham Wolbarst, Chief of the Genito-urinary Clinic at the West Side German Dispensary, for his kindness in having placed much of his large clinical material at my disposal; and further I wish to thank Dr. F. Tilden Brown for his kindly interest and encouragement.

[6] The instrument was constructed for me by the Wappler Electric Controller Co. with the efficient aid of Mr. R. Wappler.